Environmental Monitoring Unit

Management Peripheral

AP9312TH
AP9312THi

Installation and Quick Start Manual

APC®

This manual is available in English on the enclosed CD.

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Dieses Handbuch ist in Deutsch auf der beiliegenden CD-ROM verfügbar.

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Este manual está disponible en español en el CD-ROM adjunto.

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Ce manuel est disponible en français sur le CD-ROM ci-inclus.

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Introduction

Features

American Power Conversion's stand-alone Environmental Monitoring Unit (AP9312TH and AP9312THi) continuously senses temperature and humidity and monitors contacts. You can control the unit through Web, Control Console, or SNMP interfaces. Additional features include:

- Four zones of contact monitoring, each of which supports both normally open and normally closed contacts.
- Compatible sensors for fire, water, smoke, unauthorized entry, physical security, or other external conditions that can be measured by contact closure.
- Probes that can report temperature from 0 to 60° C (32 to 140° F) and relative humidity levels from 10% to 90%.
- Two levels of user access:
  - Administrator
  - Device Manager
- Brackets for mounting the unit in an APC NetShelter enclosure or other standard (EIA-310-D) 19-inch rack.
- E-mail notification for abnormal contact conditions or out-of-range temperature and humidity.
- Basic and MD5 authentication password security.

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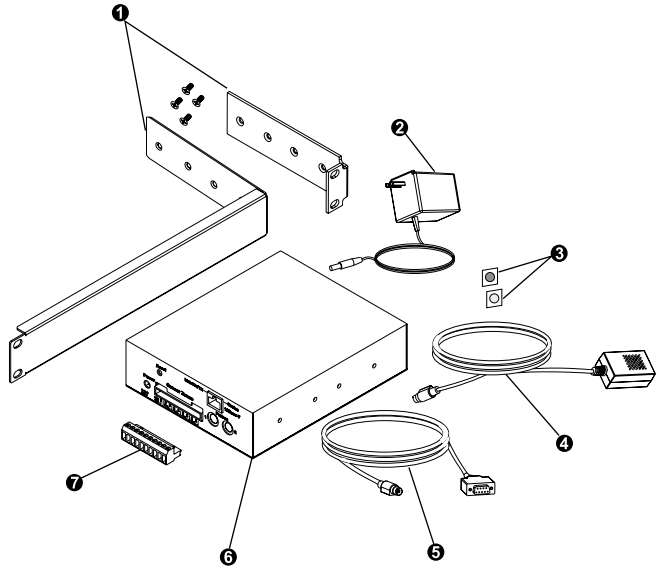
Product inventory



❶	Rack-mount brackets with 4 flat-head screws (870-8213A and 870-8183)
❷	AC power adapter
❸	Hook and loop probe fasteners
❹	Combined temperature and humidity probe (AP9512TH)
❺	Configuration cable (940-0120)
❻	Environmental Monitoring Unit
❼	Detachable screw terminal connector for contact monitoring

Continued on next page

Additional probes

To order a second temperature and humidity probe (AP9512TH), call APC Customer Support at a number listed on the back cover of this manual.

Please recycle

The shipping materials for the Environmental Monitoring Unit are recyclable. Please save them for later reuse or dispose of them appropriately.

Your inspection and warranty responsibilities

Inspect the Environmental Monitoring Unit immediately, and notify the carrier and the seller if there is any shipping damage.

Fill out and return the enclosed warranty card before you begin using the unit.

Additional documentation

This *Installation and Quick Start Manual* and the *User's Guide* are available in PDF format on the supplied CD and at the Web site http://www.apcc.com/support. The *User's Guide* contains additional information about the following:

- management interfaces
- user accounts
- menu options
- e-mail
- security
- SNMP

Note: The latest firmware versions are also available at http://www.apcc.com

Installation

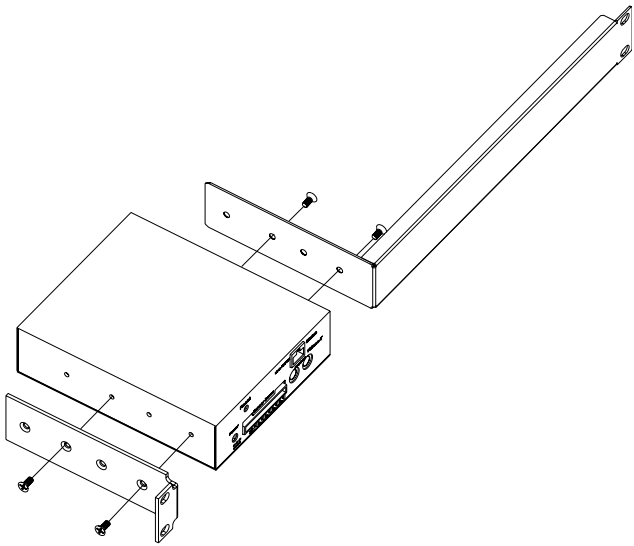
Installing outside an enclosure

To install the Environmental Monitoring Unit outside an enclosure, place it on a flat surface in a protected area with adequate air flow and minimal dust. Do not operate the unit where temperature and humidity are outside the limits specified on page 19.

Installing in an enclosure

To install the Environmental Monitoring Unit in a NetShelter enclosure or other standard (EIA-310-D) 19-inch rack:

1. Attach the rack-mount brackets (870-8213A and 870-8183) to the unit using the four flat-head screws.



2. Insert caged nuts (provided with the enclosure) on the vertical mounting rails at the location you choose for the unit-bracket assembly in the enclosure.
3. Align the assembly's brackets with the caged nuts in Step 2.

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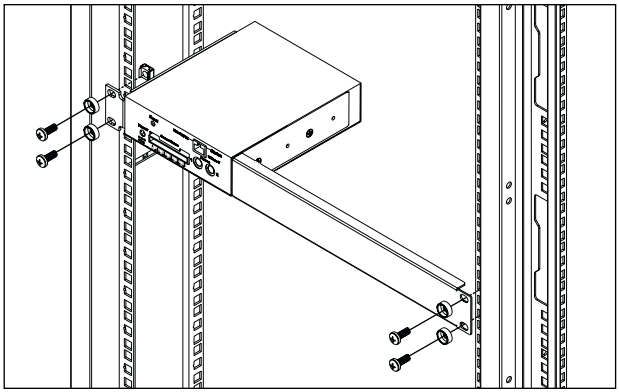
Installing in an enclosure, continued

4. Attach the assembly tightly to the enclosure using four mounting screws and four plastic cup washers (provided with the enclosure).



Connecting the probe(s)

1. Connect the supplied probe (AP9512TH) to one of the probe connectors on the unit. Seat the probe connector firmly, and connect the second probe (if you have one).
2. Using the supplied hook and loop fasteners, if needed, place each probe in an area that is within the environmental limits specified on page 19. The location must be free from direct sunlight, excessive moisture (such as dew), dust, chlorine gas, and insecticides. Do not cover any of the probe's ventilation holes.
3. Connect the supplied power adapter to the power port labeled 24VDC on the front panel of the unit.

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Connection process: overview

You must perform two procedures to set up contact monitoring.

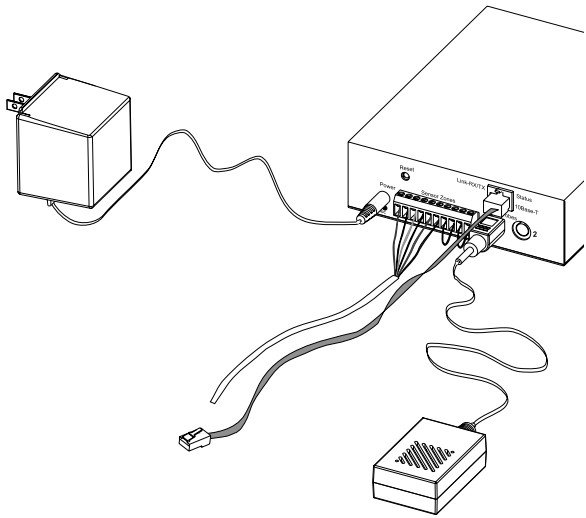
- See “Contact Sensors” on page 7 to select and connect contact sensors.
- See “Connecting dry contact devices” on this page.

Connecting dry contact devices

To connect dry contact devices to the Environmental Monitoring Unit:

1. Connect contact closure sensors to the removable screw terminal block as described in “Contact Sensors” starting on page 7.
2. The connector accepts wire sizes from 14 AWG (1.6 mm^2) to 26 AWG (0.4 mm^2). Remove 0.25" (6 mm) of the wire’s insulation.
3. Connect the screw terminal block to the unit’s Sensor Zones connector.

Following is an example of a completed installation:



To complete the setup, see “Quick Configuration” on page 11.

Contact Sensors

Selecting sensors

To monitor circuits that have no voltage potential of their own, you can use any normally open (NO) or normally closed (NC) dry contact sensors. These sensors include:

- Magnetic contact switches
- Window foils
- Tamper switches
- Heat detectors
- Water sensors
- Pressure sensors

Note: Connecting sensor inputs to circuits other than dry closure circuits voids the warranty and may damage to the unit.

To monitor sensors that require power, the Environmental Monitoring Unit provides 12 VDC at up to 60 mA at pins 1 and 2 of the Sensor Zones connector. These sensors include:

- Passive infrared (body heat) detectors
- Smoke sensors
- Photo relay detectors

For more information on types of sensors you can use with the unit, call APC Customer Support at a number listed on the back cover of this manual.

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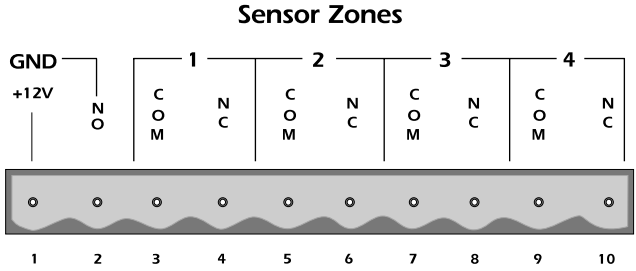
Contact Sensors, *continued*

Sensor zone description

The following figure shows the screw terminal connector and the connector pins with their associated zones.



The following table describes the zone associated with each connector pin.

Sensor Zones Connector Pinout	
Pin	**Function**
1	Power supply, +12 VDC nominal, 60 mA maximum
2	Power supply ground and normally open connection for all zones
3	Zone 1 common
4	Zone 1 normally closed
5	Zone 2 common
6	Zone 2 normally closed
7	Zone 3 common
8	Zone 3 normally closed
9	Zone 4 common
10	Zone 4 normally closed

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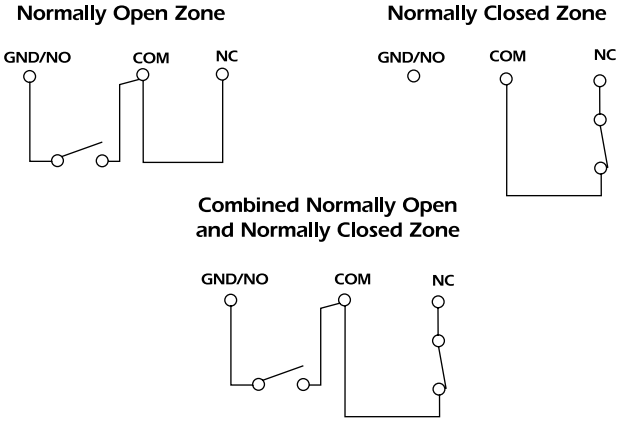
Contact Sensors, *continued*

Connection information

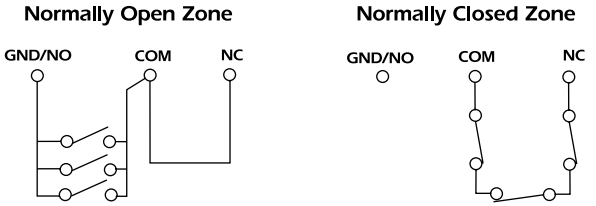
The Environmental Monitoring Unit supports normally open and normally closed loop systems and allows mixing of normally open and normally closed sensors on any zone:



Note: Do not connect the unit's sensors with sensors from any other system.

Multiple sensors in a zone

To use more than one sensor on a zone, connect normally open sensors in parallel and normally closed sensors in series:



To avoid receiving alarms for unused zones, install a jumper wire between the COM connector and NC connector of each unused zone.

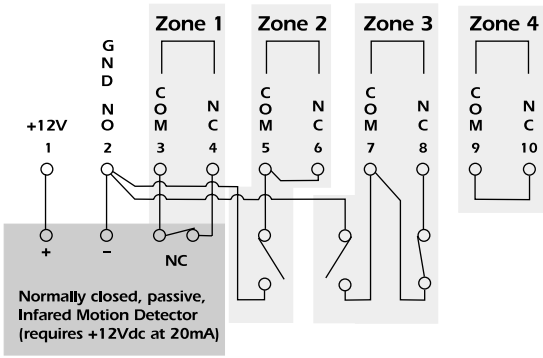
Continued on next page

Contact Sensors, *continued*

Example of a typical hookup

In this example:

- Zone 1 is a normally-closed zone with power for the passive infrared detector supplied by the Environmental Monitoring Unit.
- Zone 2 is a normally open zone.
- Zone 3 combines normally open and normally closed.
- Zone 4 is not used.



Quick Configuration

Required and optional settings

You must configure the following network settings of the Environmental Monitoring Unit before it can function on a network.

- IP address of the unit
- Subnet Mask
- IP address of the Default Gateway

No further configuration is required. The remaining properties of the unit have default settings. However, you may want to customize settings for your application. See "Managing the Unit" in the *User's Guide* (*usrguide.pdf*).

Configuring TCP/IP settings

Choose the configuration method that matches your environment:

- If you are using Windows 95, Window 98, or Windows NT, see "Through the Management Card Wizard" on this page.
- If you are not using a Windows-based platform, or if you require direct serial configuration, see "Serially through the Control Console" on page 12.
- If you are a network administrator using a computer connected to the local subnet, see "Over the Network by ARP" on page 13.
- If you are a network administrator using BOOTP, see "Over the Network by BOOTP" on page 13.

Through the Management Card Wizard. The Environmental Monitoring Unit contains a management card that provides the network interface. On a Windows 95, Windows 98, or Windows NT 4.0 workstation, the Management Card Wizard provides a quick way to configure all management card settings, including TCP/IP settings. To access the Management Card Wizard, run the program *setup.exe* on the CD-ROM supplied with the unit, and follow the on-screen instructions.

Continued on next page

Configuring TCP/IP settings, continued

Serially through the Control Console. If you are not using a Windows-based platform, or if you require direct serial configuration, use a Probe port to configure the TCP/IP settings of the Environmental Monitoring Unit's management card:

1. Connect the supplied configuration cable (940-0120) to an available serial port on your computer and to one of the Probe ports on the front panel of the unit.
2. Disable PowerChute *plus*, UNIX Respond, or any other service that uses the serial port on the computer.
3. Run a terminal emulator such as Windows HyperTerminal.
4. Configure the appropriate serial port with the following settings: 2400 bps, no parity, 8 data bits, 1 stop bit, and no flow control.

   Note: Some terminal emulators such as HyperTerminal require that you disconnect and reconnect in order for the new serial settings to take effect.
5. From your computer, press ENTER until the user name prompt appears.
6. Enter the default user name and password (*apc* for both).
7. On the Main menu, choose **Network**.
8. On the **Network** menu, choose **TCP/IP**.
9. Within the TCP/IP menu:
   a. Disable BOOTP.
   b. Accept changes.
   c. Set a valid IP address, Subnet Mask and Default Gateway for your network.
   d. Accept changes
   e. Press ESC until the Main menu appears.
   f. From the Main menu, select **Logout**.

   Note: The new settings take effect when you log out.

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Configuring TCP/IP settings, continued

Over the Network by ARP. To configure the Environmental Monitoring Unit's TCP/IP settings using ARP (Address Resolution Protocol):

1. Deploy the unit, and connect it to the network.
2. From a command prompt on a computer connected to the local subnet, type `arp -s`, the IP address of the Management Card, and the MAC address. For example:

   ```
   arp -s 159.215.240.22 00-c0-b7-78-
                         ad-90
   ```

   Note: For the MAC address, see the Quality Assurance slip, the TCP/IP menu of the Control Console, or the label on the bottom of the unit.
3. Type `telnet` and the IP address of the Management Card. For example:

   ```
   telnet 159.215.240.22
   ```
4. Log in. The default user name and password are both *apc*.
5. Configure the Subnet Mask and Default Gateway in the TCP/IP section of the **Network** menu.

Over the Network by BOOTP. BOOTP is enabled by default. Use a BOOTP server to configure the Environmental Monitoring Unit's TCP/IP settings:

1. Enter the unit's MAC address, IP address, Subnet Mask, default Gateway, and optional bootup filename.

   Note: For the MAC address, see the Quality Assurance slip, the TCP/IP menu of the Control Console, or the label on the bottom of the unit.
2. The BOOTP server provides network settings to the unit. If you specified a bootup file name, the unit attempts to transfer that file, first from a TFTP server and then from an FTP server on the same computer as the BOOTP server. The unit assume all settings in the bootup file. You can then configure other settings for the unit remotely using the Telnet, Web, or SNMP interfaces.

   Note: To create the bootup file use the Management Card Wizard.

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Accessing the unit

You can access the Environmental Monitoring Unit by using a Web browser, Telnet, or SNMP.

Through a Web browser.

1. From the browser, enter the unit's System IP address or its DNS name (if a DNS name is configured).
2. Log on to the unit. The default User Name and Password are *apc* (lowercase).

Through Telnet.

1. Type `telnet` and the System IP address of the unit.
2. Log on to the unit. The default User Name and Password are *apc* (lowercase).

Through SNMP. The default read-only community name is *public*, and the default read/write community name is *private*.

Verifying configuration

To confirm the basic operation of the Environmental Monitoring Unit:

1. Log on to the unit, and select **Environmental Monitoring Status** from the main menu.
2. Confirm the operation of the probe. With the probe properly connected, the unit reports accurate temperature and humidity. If the probe is not properly connected, the unit reports very low temperature and humidity values.
3. Confirm contact sensing. Activate each sensor in turn, according to the recommendation of the sensor manufacturer, and verify that it operates as expected.

Warranty Information

Limited warranty

American Power Conversion (APC) warrants the Environmental Monitoring Unit to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. This warranty does not apply to equipment which has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser.

Obtaining service

To obtain service under warranty you must obtain a returned material authorization (RMA) number from APC or a designated APC service center. Products must be returned to APC or an APC service center with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. For further information on obtaining service, see “If problems persist” on page 17.

Warranty limitations

Except as provided herein, American Power Conversion makes no warranties, express or implied, including warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

Except as provided above, in no event will APC be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of this product, even if advised of the possibility of such damage.

Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Troubleshooting

Maintenance

The Environmental Monitoring Unit requires periodic maintenance.

- To remove any visible buildup of dust from the temperature and humidity probe, gently brush or vacuum the probe. Do not blow any type of compressed gas into the probe.
- For maintenance of contact sensors, see the sensor manufacturer's product literature.

Correcting problems

Problem	Possible Cause	Solution
Constant alarm on one or more unused zones.	No jumper wires for unused zones.	For each unused zone, connect a wire between the COM and NC terminals.
Constant low temperature and humidity readings.	12 VDC supply (pin 1) shorted to ground or overloaded.	Correct the short circuit: examine all sensors that use the 12 VDC power supply.
Incorrect sensor readings.	Improper sensor wiring.	Correct the sensor wiring. (See "Contact Sensors" on page 7.)
Continual reports of low temperature or humidity.	Probe not connected properly.	Connect the probe properly. (See "Connecting the probe(s)" on page 5.)

Continued on next page

If problems persist

If a problem is not mentioned in “Correcting problems” on page 16, or if the problem persists:

1. Note the serial number and date of purchase of the Environmental Monitoring Unit, and contact Customer Support at a phone number on the back cover of this manual. A technician will try to help you solve the problem by phone.
2. If you must return the unity, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement of the unit.
   a. Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number, and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
   b. Mark the RMA number clearly on the outside of the shipping carton.
   c. Return the unit by insured, prepaid carrier to the address provided by the Customer Support technician.

Specifications

Electrical specifications

Item	Specification
Input voltage, nominal	24 VDC
Maximum total current draw	0.1 A @ 24 VDC (exclusive of any attached sensors)
Temperature accuracy	±2° C (±3.6° F), from 0 to 40° C (32 to 104° F)
Humidity accuracy	±8% RH, 10 to 90% RH, at 25° C (77° F) ±8% RH, 30 to 80% RH, from 15 to 30° C (59 to 95° F)
Sensor zone input response time	100 ms
Power output	12 VDC nominal, 60 mA maximum, ground-referenced

Physical specifications

Item	Specification
Size (height × width × depth)	1.73 × 5.53 × 6.75 in 4.39 × 14.0 × 17.3 cm
Weight	1.8 lb 0.8 kg
Shipping weight	4.6 lb 2.1 kg

Continued on next page

Environmental specifications

Item	Specification
Elevation: Operating: Storage:	 0 to 10,000 ft (0 to 3000 m) 0 to 50,000 ft (0 to 15 000 m)
Temperature: Operating: Storage:	 0 to 40° C (32 to 104° F) 0 to 45° C (32 to 113° F)
Probe operating temperature	0 to 60° C (32 to 140° F)
Operating humidity	0 to 95%, non-condensing

Approvals

Item	Approval
EMC verification	FCC, VCCI, DOC, and EN55022: Class A
Electromagnetic immunity	EN50082-1 verified

Radio Frequency Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user will bear sole responsibility for correcting such interference.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Life-Support Policy

General policy

As a general policy, American Power Conversion (APC) does not recommend the use of any of its products in the following situations:

- life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the *life-support device* or to significantly affect its safety or effectiveness.
- direct patient care.

APC will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of American Power Conversion is adequately protected under the circumstances.

Examples of life-support devices

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults or infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with this modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

Declaration of Conformity

Application of Council Directives	89/336/EEC
Standards to Which Conformity is Declared	EN55022, EN55024
Manufacturer's Name and Address	American Power Conversion 132 Fairgrounds Road West Kingston, Rhode Island 02892 USA –or– American Power Conversion (A.P.C.) b.v. Ballybrit Business Park Galway, Ireland
Importer's Name and Address	American Power Conversion (A.P.C.) b.v. Ballybrit Business Park Galway, Ireland
Type of Equipment	Management Peripheral
Model Numbers	AP9312THi
Serial Numbers	WA0001000000 and above
Year of Manufacture	2000 onward

We, the undersigned, hereby declare that the equipment specified above conforms to the above directives.

St. Louis, MO February 16, 2000 Ted Eckert
Regulatory Compliance Engineer

Galway, Ireland February 16, 2000 Ray Ballard
General Manager, Galway

www.apc.com

APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
  - http://www.apc.com (Corporate Headquarters)
    Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - http://www.apc.com/support/
    Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

APC Headquarters (U.S. and Canada)	(1) (800) 800-4272 (toll free)
Latin America	(1) (401) 789-5735 (United States)
Europe, Middle East, Africa	(353) (91) 702020 (Ireland)
Japan	(03) 5434-2021 Guidance 3

  - Local, country-specific centers: go to http://www.apc.com/support/contact for contact information.
- Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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